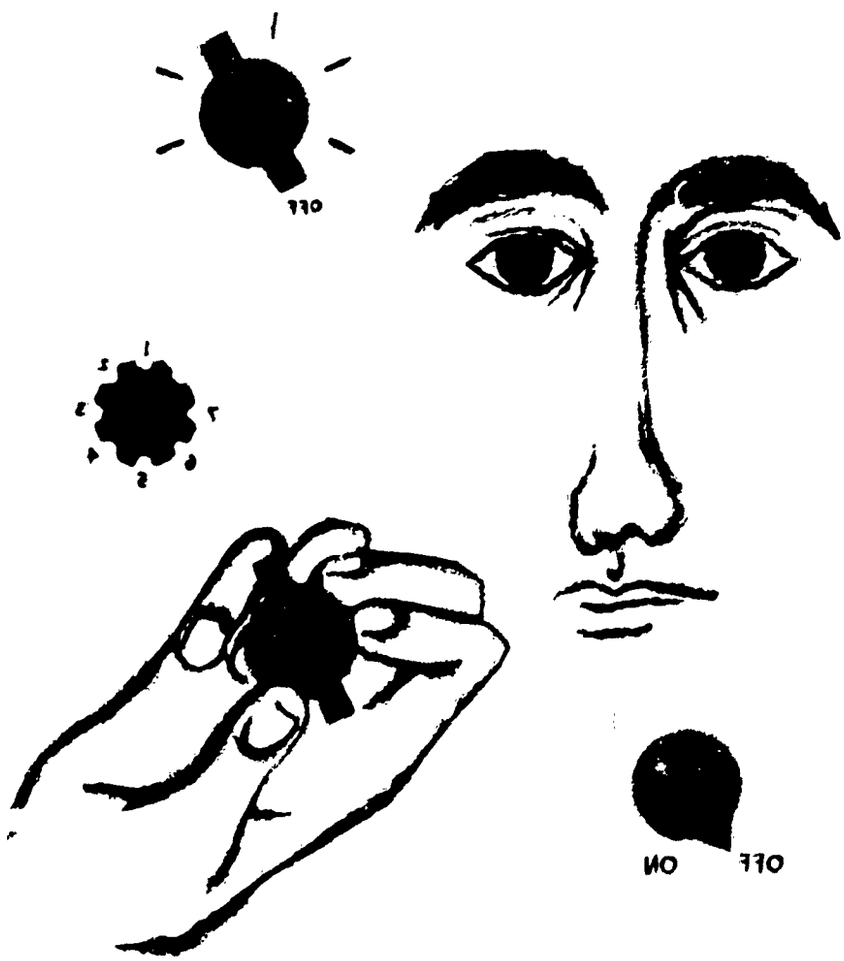
an index of
electronic
equipment
operability

INSTRUCTION MANUAL



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An Index of Electronic Equipment Operability

INSTRUCTION MANUAL

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FOREWORD

The Instruction Manual contains detailed instructions for evaluation with the Index of Electronic Equipment Operability. The manual is one of five related documents. In addition to the manual, the Data Store and Evaluation Booklet are required for evaluating equipment. The Sample Equipment Evaluations report contains detailed evaluations of four equipments, including recommendations. The Report of Development constitutes the final technical report, and describes the development of the Index.

It is appropriate here to call the attention of Index users to the interpretation of Index results. Because the results of evaluation are numerical in nature, there may be a recurrent tendency to overemphasize the results. It must be pointed out that these results are meaningful only when interpreted within the context of all that is known about the equipment. Divorced from this context, the results may be misleading.

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INTRODUCTION

This manual is intended to provide guidance for evaluators in applying the Index of Electronic Equipment Operability. In addition to this manual, application of the Index requires a Data Store booklet and an Evaluation Booklet. The Data Store provides quantitative standards for estimating human reliability and speed of performance for various types of operations. The Evaluation Booklet contains a standard format for recording the results of an evaluation. Background information concerning the Index and a description of its development are presented in the technical report, Development of an Index of Electronic Equipment Operability.

This instruction manual is divided into three major sections. The first section provides a general description of the Index and its purpose. The second section contains detailed instructions for applying the Index. Explicit instructions are provided for the data collection, scoring, and summarizing steps in the evaluation. General guidance is offered for the judgmental processes of interpreting the results of the evaluation and deriving design and other recommendations. The third and final section of the manual is the Appendix, which contains samples of the various forms used in the application of the Index.

DESCRIPTION OF THE INDEX

Purpose

The purposes of the Index of Electronic Equipment Operability are to:

1. Predict the average time required for, and reliability of operator performance.
2. Provide a quantitative basis for identifying specific human engineering design problems and developing recommendations for overcoming or minimizing these problems.
3. Organize the results of the evaluation in a form which facilitates due consideration for selection and training requirements.

Assumptions

To assure that the Index achieves the purposes stated above, the following conditions must be met in each application of the Index.

1. Available equipment and task information must accurately describe the design and operating characteristics of the equipment to be evaluated. Any change in the design of the equipment or the allocation of operator responsibilities will alter the detailed evaluation results and may significantly alter the interpretation of the results.
2. The Index is intended for prediction of performance by relatively unselected personnel who have received only nominal training. In most cases, rigid selection criteria or intensive training will result in operator performance that is faster and more reliable than performance predicted by the Index.
3. The Index should be applied by a professional human factors engineer or other personnel qualified to evaluate man-machine interactions.

Information Required for Evaluation

Two general types of information concerning the equipment to be evaluated must be obtained before the Index can be successfully applied to the equipment.

1. Equipment Information. Data concerning the equipment should include layout of the equipment, where and how it will be installed, the mission it is intended to accomplish, reaction time in meeting mission objectives, and detailed information about the displays and controls available to the operator. Potential sources of such information include equipment descriptions and design drawings prepared during the development of the equipment, mock-ups, and operational and maintenance manuals.
2. Operating Information. The second type of required information for the evaluation should contain a detailed description of the activities required of the operator during normal and emergency modes of operation. This information may be obtained from a task analysis, operational manuals, or directly from a proficient operator of the equipment. Even with multiple sources of information concerning operation of the equipment, it may still be necessary for the evaluator to depend upon inferences about operation, particularly with regard to the mental processes required of the operator.

For both types of information specified above, it will be necessary for the evaluator to cross-check the validity of the data obtained to insure that the description of the equipment and its operation is completely accurate. In all cases, multiple sources of information should be utilized if available.

In general, the later the stage of equipment development at which the evaluation is performed, the more complete and accurate will be the information available to the evaluator.

Behavior Analysis

The basic problem in evaluating human behavior, such as that required of an equipment operator, is that complex behavior is seldom duplicated from one situation to another in complete detail. It is necessary, therefore, in order to analyze and evaluate such behavior, to first reduce it to a small enough unit of behavior that it may be compared with available information on similar microscopic units from a number of situations. For purposes of the Operability Index, a behavior is considered to be a discrete step or action in a given task. Placing the high voltage switch in the ON position would, for example, be one step in a task required for the activation of an equipment unit.

In order to establish estimates of time and reliability in performing a given behavior or step, it is first analyzed into the following three aspects:

1. Input or stimulus which initiates the behavioral step. The stimulus may come from an indicator such as a light, scope, or meter; from an informational job aid such as a manual or checklist; from what the operator "knows" must be done; or from successful completion of the preceding step.
2. Mediating process or thinking which is required between receiving the input and making the proper response. This mediating process may be virtually automatic, fairly simple, such as comparing two numerical inputs, or quite complex, such as evaluating threats.
3. Output or response which is the overt, observable part of the behavior and may involve such things as verbal communication, writing, or activating a control.

The Index is based on the independent assessment of the performance time and operator reliability associated with each of these three aspects of input, mediating process, and output for each behavioral step. Time and reliability are a function of certain characteristics of each of the three aspects of behavior. Relevant categories of characteristics for each aspect of behavior are presented in the Data Store, along with time

and error estimates attributable to each. The first major step of the evaluation, therefore, is determining the characteristics relevant to a particular step of behavior being analyzed and then matching these characteristics with those contained in the Data Store. A sample page from the Data Store is presented as Figure 1.

JOYSTICK
(May move in many planes)

BASE TIME = 1.93

Time added	Reliability	
		1. Stick length
1.50	.9963	a. 6-9"
0	.9967	b. 12-18"
1.50	.9963	c. 21-27"
		2. Extent of stick movement (Extent of movement from one extreme to the other in a single plane.)
0	.9981	a. 5-20°
.20	.9975	b. 30-40°
.50	.9960	c. 40-60°
		3. Control resistance
0	.9999	a. 5-10 lbs.
.50	.9992	b. 10-30 lbs.
		4. Support of operating member
0	.9990	a. Present
1.00	.9950	b. Absent
		5. Time delay (Time lag between movement of control and movement of display.)
0	.9967	a. .3 sec.
.50	.9963	b. .6-1.5 sec.
3.00	.9957	c. 3.0 sec.

Figure 1. **Sample Data Store Card**

The example presented in Figure 1 relates to the output aspect of behavior associated with the movement of a joystick control. Entry to this information in the Data Store would be accomplished by first identifying that the output aspect of behavior being analyzed was through movement of a joystick. Joystick then is the component level of analysis Further analysis of the behavior would reveal the relevant parameters, such as stick length, control resistance, etc. for the particular situation.

Finally, the relevant dimensions of the behavior, such as the actual length of the stick could be determined. It is at this level, dimensions, that matching of the behavior being analyzed with the content of the Data Store occurs. In most cases, more than one parameter will be relevant to the aspect of behavior being analyzed. In these cases, the times and reliabilities associated with the various dimension values for the parameters concerned are combined. This combination is a simple addition for time values and a multiplication of reliabilities.

A potential source of confusion in conducting the behavior analysis may be the role played by feedback. Feedback may be defined as the information resulting from operator performance; for example, the "feel" of a control as it goes into a detent position. The following two types of feed back are assessed in different ways for the purposes of the evaluation.

1. Directing feedback. The first type of information resulting from operator performance serves only to direct or aid control manipulation. Stimuli or information that primarily aid control manipulation, such as labels or associated display features, are assessed as parameters of that control. Data relating to this type of feedback is contained in the Data Store for control components under the parameter, "Clarity of Control Indications."
2. Initiating feedback. Feedback which signals the end of one step of behavior and serves as the input to the next step, such as an indicator light or scale value, is assessed with the step of behavior it initiates. Such feedback may be ignored, however, if there are other inputs which initiate the behavior or if initiating feedback does not have a clear role in initiating the subsequent behavior.

Between Step Analysis

In some situations, operational time is consumed between the end of one behavioral step and the beginning of the next. This time is usually a result of either required perceptual or location shift by the operator.

Perceptual shift refers to the time required for the operator to shift his attention from one control or display to another. Perceptual shift does not require that the operator physically move from one location to another. Normally, the time required for perceptual shift can be ignored, since it is of very short duration. It should be noted in the evaluation only when excessive. Location shift refers to a physical movement of the operator from one station to another and includes perceptual shift as a component of the required behavior. Physical shift would normally be recorded in the evaluation, since it is usually of longer duration than a simple perceptual shift.

In addition to loss of time due to perceptual or location shift by the operator, operational time may be consumed by requirements of the equipment itself. This equipment delay time may be due to such design features of the equipment as warm-up time, circuitry lags, etc. Loss of time due to equipment delay should be recorded to provide a realistic estimate of total mission time required for the equipment.

Evaluation Results

The results of the behavior and between step analysis previously described are recorded on the Evaluation Sheet and totals are computed for each aspect of behavior for the step and for the step as a whole. After this worksheet is completed, summaries are prepared based on the step and aspect values.

The first summary prepared is the computation of totals for each phase of the mission and for the total mission. These totals are entered on the Mission and Phase Summary Form. Results are separately summarized on this form for the behavioral aspects of input, mediating process, and output, as well as for perceptual shift, location shift, and equipment delay.

The second summary prepared contains totals by component for each of the mission phases and is reported on the Component Summary Form.

The purpose of the summary forms, samples of which are contained in the Appendix of this report, is to present in concise, usable form the information required by the evaluator in developing systematic recommendations dealing with the design of the equipment, training for operation of the equipment, and selection of personnel to operate the equipment.

Summary Description

A graphical summary of the basic evaluation process involved in the Index is presented in Figure 2. Essentially, the individual steps of operation are analyzed in their component parts. Scores for these components are determined with the aid of the Data Store. The component scores, and between step time scores, are then combined into step scores. The step scores can then be combined in various ways to yield total aspect, phase, and mission scores. Total scores for specific components are taken from the general component scores. This array of quantitative information of different levels can then be used to guide decisions and recommendations concerning the equipment evaluated.

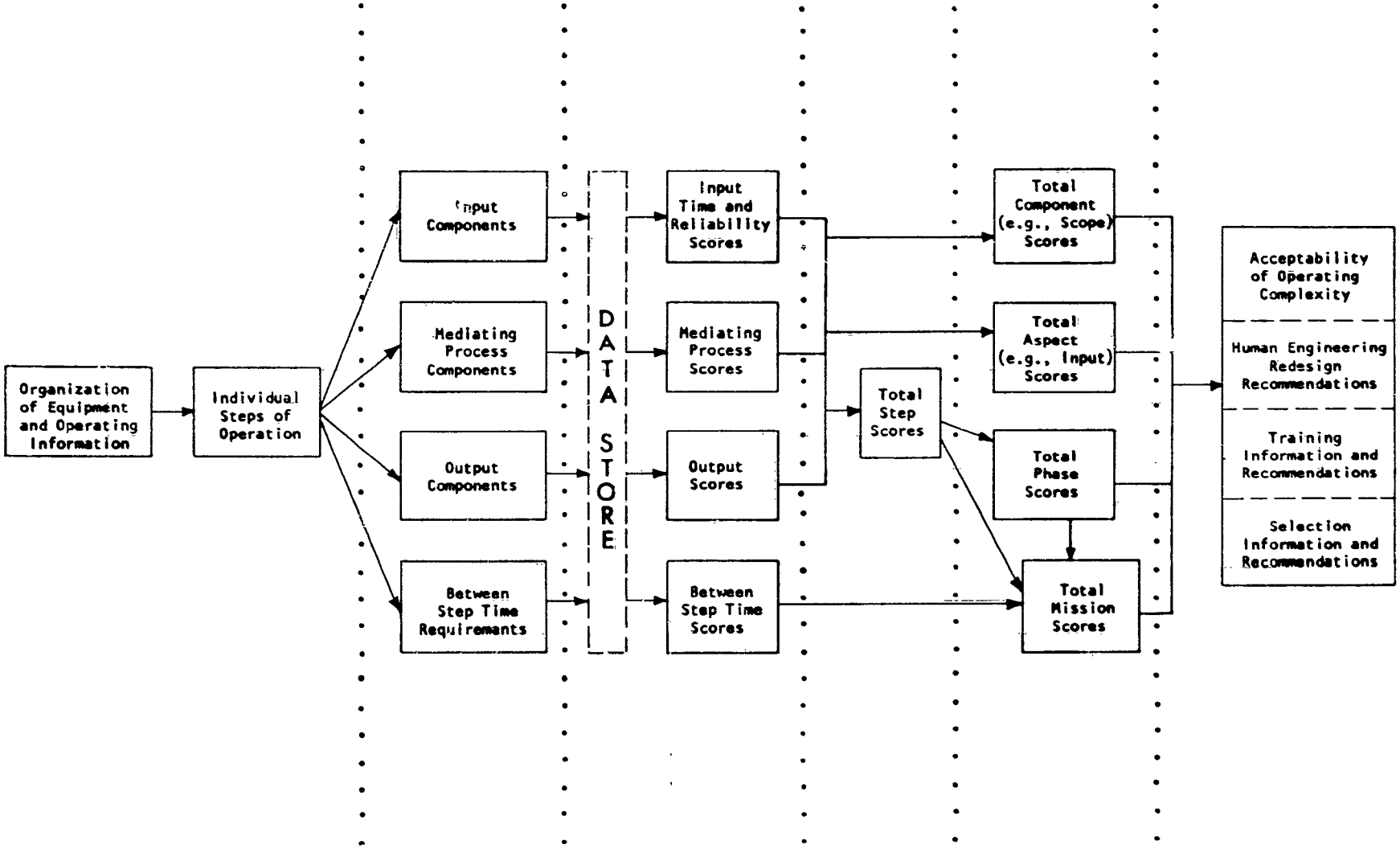


Figure 2. Graphical Summary of the Basic Evaluation Process

INSTRUCTIONS

The application of the Index requires the completion of six major steps or processes. These steps are listed briefly below. Detailed instructions for each step are contained in subsequent sections of the report.

1. Organize Equipment and Operating Information. Data obtained from task analyses and other sources must be analyzed into behavioral steps and sequenced by mission phases of operation.
2. Collect Evaluation Data. This step includes the identification of relevant components, parameters, and dimensions for each step; matching these values with the data in the Data Store; and entering the appropriate values on the Evaluation Sheet.
3. Score Evaluation Sheet. Step scores are computed for each aspect of behavior and across aspects for total step scores by adding together the relevant time entries and multiplying together the reliability estimates. These totals are entered on the Evaluation Sheet.
4. Summarize Results by Mission and Phase. Total values for each phase of the mission and for the total mission are computed from the data on the Evaluation Sheet similar to the method for obtaining step totals. The results of this summary are entered on the Mission and Phase Summary sheet.
5. Summarize Results by Component. Total values for each component of the input, mediating process, and output aspects of behavior are computed across the steps of each phase of the mission. The values are entered on the Component Summary Form.
6. Derive Recommendations. Based on the summarized results of the evaluation listed above, recommendations may be developed in the following three areas:

a. Redesign. Redesign recommendations are based on consideration of total component scores on the Component Summary Form and selection of alternate dimensions from the information contained in the Data Store to improve potential operator performance.

b. Training. Training recommendations will be based on analysis of the Component Summary Form and will identify aspects of performance that should be given special attention in the training of operators.

c. Selection. Selection recommendations will be based on identification of aspects of behavior which contribute significantly to total mission scores on the Mission and Phase Summary Form. These aspects may then be related to general selection requirements for operators emphasizing these aspects.

ORGANIZE EQUIPMENT AND OPERATING INFORMATION

1. Determine the basic mission of the system based on an analysis of the documents cited previously, such as manuals, task analyses, etc. The mission of a system might be, for example, "to detect and locate enemy troop movements."
2. Analyze the mission of the system into the operational phases required to accomplish the mission. The initial phase of a system might be, for example, activation of the system, or preliminary adjustment of the system.
3. Order the operator behaviors sequentially in each phase of the mission. The listing of behaviors should be checked to insure that they involve only a single step or action, since that is the level required for the analysis.
4. In the event that there are alternate procedures or sequences of behavior available to the operator, include only the most common or most frequent in the evaluation.
5. If the operation of the equipment in a particular phase requires the repetition of a behavioral step, this step should be included in the evaluation as often as it is likely to occur. This repetition situation is likely to occur with certain alignments or adjustments of the equipment.
6. Behaviors which are required only if some relatively unlikely event takes place should be assessed only if this unlikely event is an integral part of the system mission.
7. The final list of sequenced behavioral steps for each phase should then be recorded in some convenient and appropriate format. No specific format is specified in the evaluation.

COLLECT EVALUATION DATA

Analyze the first step of the first mission phase and enter the step number on the Evaluation Sheet. (A complete Evaluation Sheet is included as page 1 of the Appendix.)

Identify the source of the Input in equipment nomenclature and record it.

Locate the relevant Input component in the Data Store and enter it on the form.

Enter the Base Time associated with the component.

Using the Data Store as a checklist, determine the parameters relevant to the particular situation. The parameters selected from the Data Store must be matched with the pre-printed numbers under the "Par." (Parameter) column. For each relevant parameter, the dimensions which best describe the attributes of this particular component should be noted, by code letter, under the column headed "Dim. Ind." (Dimension Indication). Some parameters in the Data Store for the component being considered may not be appropriate. If so, leave the space blank on the form, or line through it.

As appropriate dimensions are chosen, enter the time and reliability values by dimension on the form.

Repeat the above procedure for the mediating process and output aspects of the behavioral step.

In the event that more than one Input or Output is associated with a particular step, the additional components are evaluated in the adjoining column.

Step No. 1

Input

Display Ident. Ready Light
Component Light
Base Time .26

Par.	Dim. Ind.	Time	Rel.
1	c	0	9999
2	a	0	9999
3	—	—	—
4	d	3.50	9946
5	a	0	9998
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Mediating Process

Component Id / Rec.
Base Time .25

Par	Dim. Ind.	Time	Rel.
1	a	0	9998
2			
3			
4			
5			
Total			

Output

Control Ident. Start P.B.
Component pushbutton (P.B.)
Base Time .57

Par	Dim. Ind.	Time	Rel.
1	b	.08	9999
2	a	0	9997
3	—	—	—
4	—	—	—
5	b	.75	9998
6	a	0	9996
7			
8			
Total			

Step Totals		

Between Step Time

Percept.	Location	Equip. Delay

SCORE EVALUATION SHEETS

Separate scores are computed for each component of each step. The step scores are then computed using the component scores.

For each component, add the Base Time and other time data entered. Put the Total in the appropriate space.

To determine component Reliability, multiply together all reliability measures entered in the component. This will require a standard desk calculator.

Enter the final product as the Component total reliability.

Repeat this process for all components in the step.

Total STEP Time is simply the addition of all component times within the step. Enter this sum in the appropriate STEP TOTAL space.

Total STEP Reliability is the product of multiplying together all the component reliabilities. Enter this result in the appropriate STEP TOTAL space.

Time required for either perceptual or location shift is assessed when there is significant time lapse involved. Enter this time in the appropriate space. Equipment delays should also be noted at this point.

Step No. 1

Input

Display Ident. Ready Light

Component Light

Base Time 7.26

Par.	Dim. Ind.	Time	Rel.
1	C	0	9999
2	a	0	9999
3	—	—	—
4	d	3.50	9944
5	a	0	9995
6			
7			
8			
9			
10			
11			
12			
13			
Total		3.76	.9942

Mediating Process

Component Ad/Rec

Base Time .25

Par	Dim. Ind.	Time	Rel
1	a	0	9997
2			
3			
4			
5			
Total		.25	.9998

Output

Control Ident. Start P.B

Component Pushbutton (P.B.)

Base Time .57

Par	Dim. Ind.	Time	Rel.
1	b	.08	.9999
2	a	0	.9997
3	—	—	—
4	—	—	—
5	b	.75	.9998
6	b	0	.9996
7			
8			
Total		1.40	9990

Step Totals	5.41	9930

Between Step Time

Percept.	Location 2.00	Equip. Delay

SUMMARIZE RESULTS BY MISSION AND PHASE

1. Enter identification information in the spaces provided at the bottom of the Summary Form (page 2 of the Appendix).
2. Arrange completed evaluation sheets by phases of operation, and identify phases on the Form in the appropriate places.
3. For each phase, ADD all of the Input component times from the evaluation sheets. Enter the sum in the Input column under time for the appropriate phase.
4. Repeat this process for the Mediating Process and Output aspects that occur in each phase.
5. For each phase, enter the sum of all location and perceptual shift times and equipment delay times in the appropriate space.
6. For each phase, MULTIPLY together all of the Input component reliabilities from the evaluation sheets. Enter the product in the Input column under "Reli." for the appropriate phase.
7. Repeat this process for the Mediating Process and Output aspects that occur in each phase.

FOR TOTAL PHASE SCORES

1. For each phase, ADD the Input, Mediating Process, Output, and Perceptual and Location Shift times and note the total phase time in the space provided.
2. For each phase, MULTIPLY together the Input, Mediating Process, and Output reliabilities and record the product in the appropriate space.

FOR TOTAL ASPECT SCORES

1. ADD all of the INPUT time scores for all phases. Enter this as the total time for the Input aspect.
2. MULTIPLY all of the INPUT reliabilities for all phases. Enter the product as the total reliability for the Input aspect.
3. Repeat this process for the Mediating Process and Output aspects, recording the total in the appropriate spaces.

4. ADD all of the perceptual and location shift times and the equipment delay times for all phases, recording the results as if they were aspect total scores.

FOR TOTAL MISSION SCORE

1. ADD all of the Total Phase Time Scores. The result is Total Mission Time.
2. MULTIPLY all of the Total Phase Reliability scores together. The result is the Total Mission Reliability.

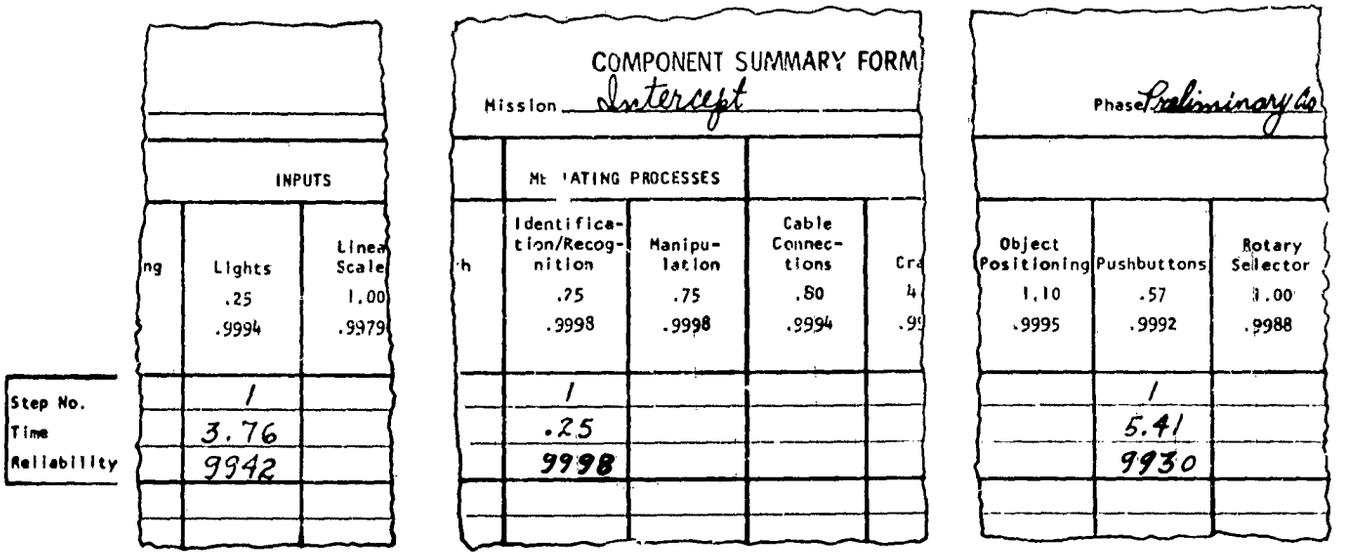
> Note: These scores can be checked in the following way: Add together all of the Aspect Total Time scores (except for equipment delay time). The result should be equal to Total Mission Time. Multiply together all of the Aspect Total Reliability Scores. The result should be equal to Total Mission Reliability, within the limits of rounding error.

SUMMARIZE RESULTS BY COMPONENT

1. Enter identifying information at the top of the form. A separate Summary Form is prepared for each phase of operation.
2. From the Evaluation Sheets, observe the Input component for the first step. Locate this component on the Component Summary Form. Enter the step number, the component total time and total reliability in the space provided.
3. Repeat this process for the Mediating Process and Output components for the first step. Using the example from page 14, the Component Summary Form entries would appear as below.
4. Repeat this process for every step of the phase, and on additional forms, for every phase of the mission.

FOR COMPONENT TOTALS:

1. For each component, ADD all time scores. Enter this sum as the Total Time for that component at the bottom of the form.



COMPONENT SUMMARY FORM

Mission Intercept

Phase Preliminary Go

	INPUTS		MEDIATING PROCESSES						
	ng	Lights	Linear Scale	h	Identification/Recognition	Manipulation	Cable Connections	Cr	Object Positioning	Pushbuttons	Rotary Selector
		.25	1.00		.75	.75	.80	4	1.10	.57	3.00
		.9994	.9979		.9998	.9998	.9994	.9	.9995	.9992	.9988
Step No.		1			1					1	
Time		3.76			.25					5.41	
Reliability		9942			9998					9930	

2. For each component, MULTIPLY together all reliability scores. The product is the Total Reliability for that component, and is entered in the appropriate space at the bottom of the form.

FOR MISSION COMPONENT TOTALS:

1. ADD each of the component Total Time scores across all phases. The result is the total time required for this component during the entire mission.
2. MULTIPLY each of the component Total Reliability scores over all phases. The result is the total reliability attributable to the individual components during the entire mission.

DERIVE RECOMMENDATIONS

Redesign

Redesign recommendations will be made at the component level to overcome design problems that have been identified in the course of the evaluation. Potential design problems may result from two different sources.

1. A component may be penalized for design defects with a consequent increase in time requirements or lowering of reliability. In some cases, however, it may be that redesign to decrease time may result in a decrease in reliability, or vice versa. In such cases, a trade-off in design must be made based on the mission of the system, i.e., is time or reliability of primary importance in meeting mission objectives.
2. A well-designed component may be penalized simply because the component is involved in a number of steps. This is simply a result of the fact that the more often a step is performed, the more total time it takes, and the more likely it is that an error will occur. Even though the component is well-designed, consideration should be given to improvement of the design, since an improvement, even though slight for a single step, becomes significant over a large number of repetitions.

The following procedure is suggested for generating redesign recommendations to insure that no reasonable possibilities are overlooked.

1. Analyze Total Component Scores on the Component Summary Form.
2. Identify those components that contribute most significantly to Total Mission time and reliability.
3. Compare the individual step scores within the selected components with the base time and optimum reliability indicated at the top of each column.

4. Select for further consideration those components where step scores are generally higher than base time or lower than optimum reliability.
5. Compare the evaluation of each component, wherever it occurs, with the Data Store information for that component.
6. Identify alternative dimensions which would reduce time and/or increase reliability.
7. Determine the total amount of time which would be saved, or the increase in reliability that would be obtained for each potential change in parameter dimensions. Time saved is the difference between the actual time added for the dimension already included in the component and the time that would be added if the alternate dimension has been chosen instead. This difference is added across all occurrences of the component.
8. Recommend that the component be redesigned if the savings in time or increases in reliability are sufficiently large. Such recommendations must be feasible within engineering constraints.

Training

The purpose of training recommendations based on interpretations of the Index is to overcome design problems of the equipment that are not suitable or amenable to redesign. It is not intended that these recommendations include overall training program recommendations. Rather, they should be restricted to training suggestions for particular components. Two types of training recommendations can be derived from the Index.

1. Those steps involving difficult components can be specified for specific rehearsal during practice sessions with the equipment.
2. The specific parameters and dimensions of a component that may cause operational problems can be identified for emphasis during all stages of training.

The following procedure is suggested for the derivation of training recommendations. It should be pointed out, however, that this is essentially a judgmental process by the evaluator and that it is unlikely that any two evaluators would arrive at exactly matching recommendations.

1. Identify those components that contribute significantly to total mission scores that are not subject to redesign. This can be accomplished at the same time that redesign recommendations are being considered.
2. Determine the type of recommendation required by analyzing the nature of the component.
3. Specify the information about the component required to adequately implement the recommendation, e.g., the specific dimensions that account for the problem.

Selection

Selection recommendations based on Index results must, of necessity, be made at a generalized level. This is due to the fact that the specific relationship between Index results and selection criteria is not presently known. However, it appears reasonable that a relationship exists between Aspects of behavior and general classes of aptitudes and abilities. The following relationships between the two sets of variables appear to be reasonable.

Aspects	Aptitudes
Inputs	Visual or Auditory Reception
Mediating Processes	Discrimination, Decision Making, Intelligence
Outputs	Motor or Verbal Skills

In some cases, selection recommendations may be made as alternatives to training recommendations. For example, it may appear to the evaluator that providing the kind of training required to insure adequate performance would be difficult if not impossible to accomplish, whereas selecting operators with the required skills "built in" might be quite feasible.

The following general procedure is suggested for generating selection recommendations.

1. Analyze the ASPECT Total scores on the Mission Summary Form.
2. Select the Aspect which contributes most to the total mission scores.
3. Check the individual step entries for the Aspect selected and the Component Summary data, and determine the general nature of the problem.
4. Recommend the selection of operators with abilities which will overcome or minimize the problems associated with this Aspect.

JUSTIFICATION

All design recommendations may be justified by demonstrating, in specific quantitative terms, the extent to which performance time and/or operator reliability will be enhanced by implementation of the suggested modification. For example, a certain design change may reduce performance time by 3.67 seconds, and increase operator reliability from .8732 to .8961. Justification of a design modification usually should be expressed in terms of potential changes in total mission scores. However, computation of these factors should be possible at any level. That is, revised time and reliability scores may be stated for steps, components, aspects, or any other phase of operation.

Time

Calculation of the time which would be saved by implementation of a given design recommendation is easily computed with the following formula:

$$S_T = (T_E - T_C)N$$

where:

S_T = time saved over mission performance,

T_E = time added for a dimension assessed on the evaluation,

T_R = time added for the dimension recommended as a modification, and

N = number of times the modified component is used during system operation.

For example, assume a total mission time of 270 seconds. A part of this total, 70 seconds, is attributable to operating rotary selector switches 10 times (N). One relevant factor affecting the operating time of these selector switches is 15° distance between adjacent positions. This distance adds .60 seconds (T_E) to each operation, or a total of 6.00 seconds for all 10 operations. A recommendation to increase distance between adjacent switch positions from 15° to 25° would be in order.

Time added by this recommended distance is 0 seconds (T_R). Thus, time saved (S_T) by implementing this recommendation would be:

$$S_T = (.60-0)\ (10) = 6.00 \text{ seconds}$$

This reduces time attributable to selector switches from 70 seconds to 64 seconds, and reduces total mission time from 270 to 264 seconds.

Reliability

The total reliability estimates are products of all relevant reliability scores at the dimension level. Total mission reliability is, thus, the product of all dimension reliability scores, while phase reliability estimates are products of those dimensions contained within the phase. Recommendations which change a dimension also change the associated reliability score. This change in score affects the total reliability estimate. It is this effect which, with time, justifies the recommendation. The determination of total effect becomes more complex as the number of changes recommended increases.

Assuming a recommendation results in a single different dimension reliability score, the new or recommended total reliability (R_r) can be simply determined. The procedure is to divide the original total reliability (R_o) by the original dimension reliability score (r_o), and then multiply this quotient by the new or recommended dimension reliability score (r_r). Thus:

$$R_r = \left(\frac{R_o}{r_o}\right)(r_r) \text{ or, } R_r = R_o\left(\frac{r_r}{r_o}\right)$$

However, if this single dimension occurs a number of times, then the effect each time it occurs must considered. The above formula then becomes:

$$R_r = R_o\left(\frac{r_r}{r_o}\right)^n$$

where n is the number of steps affected by the recommendation.

Even with n quite small, the computation becomes laborious. To reduce the effort involved, expected values of $(\frac{r_r}{r_o})^n$ have been computed and are presented in Table I. The table presents all quotients from $\frac{.9999}{.9900}$ to $\frac{.9999}{.9998}$, which exhausts the range of values expected, raised to powers of n sufficient to cover most evaluations. For further convenience, the quotients from the above range are presented in Table II. This table presents the range of values of r as dividend and divisor. The intersecting cell in the table presents the quotient.

The procedure for determining the effects of a recommendation on total reliability are as follows:

1. Enter the proper values in the formula $R_r = R_o (\frac{r_r}{r_o})^n$
2. To determine the quantity $(\frac{r_r}{r_o})$, ENTER TABLE II with the two quantities, and read the quotient from the intersecting cell, or perform the division in the conventional way.
3. To determine the quantity $(\frac{r_r}{r_o})^n$, ENTER TABLE I with the quotient from (2) above, for the value of n required.
4. Multiply this figure by R_o. The result is the total reliability assuming the recommendation is implemented (R_r). This total reliability may be total component, total step, total phase, or total mission reliability, depending upon the needs of the specific case.

Note: Although it is unlikely, some relevant values of r or n may not be included in the tables. In this event, conventional computation routines will be required.

Determination of Joint Recommendations

To determine the effects of all redesign recommendations (or for any combination of recommendations) on total mission reliability:

$$MR_r = \frac{r_{r_1}^{\,n} \cdot r_{r_2}^{\,n} \cdot r_{r_3}^{\,n} \cdots r_{r_k}^{\,n}}{r_{o_1}^{\,n} \cdot r_{o_2}^{\,n} \cdot r_{o_3}^{\,n} \cdots r_{o_k}^{\,n}} \cdot MR_o$$

where MR_r is the Mission Reliability given all redesign recommendations, and MR_o is the original Mission Reliability and the other quantities as identified previously.

Since the previous steps of the preceding procedure have identified each of the $\left(\frac{r_r}{r_o}\right)^n$ values, the above formula may be written in the following form for computational convenience:

$$MR_r = MR_o \cdot \left[\left(\frac{r_{r_1}}{r_{o_1}}\right)^n\right] \left[\left(\frac{r_{r_2}}{r_{o_2}}\right)^n\right] \left[\left(\frac{r_{r_3}}{r_{o_3}}\right)^n\right] \cdots \left[\left(\frac{r_{r_k}}{r_{o_k}}\right)^n\right]$$

SUMMARY RECOMMENDATION TABLE

A form presented in the Appendix is provided with the Index materials for summarizing all the recommendations made. The process involved is simply collecting and briefly expressing the recommendations made. This form is intended to present, in a single location, the following information:

1. Brief descriptions of redesign recommendations for all relevant components, and the number of operating steps affected by the recommendations.
2. Time and reliability estimates for both existing and redesign configurations. This data is presented at the component phase and total mission level.
3. Brief resumes of selection and training recommendations made. The justifications here are logical, rather than quantitative and, thus, are usually more difficult to summarize. If a clear summary justification cannot be presented, there should be a reference to the logical development of the recommendation in the text.

... Reliabilities of Recommended Design

N (Number of steps affected by recommendation)

Ratio of original to recommended reliability $\left(\frac{r_r}{r_o}\right)$

	.9999	.9998	.9997	.9996	.9995	.9994	.9993	.9992	.9991	.9990	.9989	.9988	.9987	.9986	.9985	.9984	.9983	.9982	.9981	.9980	.9979	.9978	.9977	.9976	.9975
.9990	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006
.9991	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005
.9992	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004
.9993	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003
.9994	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002
.9995	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001
.9996	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000
.9997	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009
.9998	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008
.9999	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007
1.0000	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	1.0000	1.0009	1.0008	1.0007	1.0006

	.9999	.9998	.9997	.9996	.9995	.9994	.9993	.9992	.9991	.9990	.9989	.9988	.9987	.9986	.9985	.9984	.9983	.9982	.9981	.9980	.9979	.9978	.9977	.9976	.9975
.9950	1.0049	1.0048	1.0047	1.0046	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025
.9951	1.0048	1.0047	1.0046	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024
.9952	1.0047	1.0046	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023
.9953	1.0046	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022
.9954	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021
.9955	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020
.9956	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019
.9957	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018
.9958	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017
.9959	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016
.9960	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015
.9961	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014
.9962	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013
.9963	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012
.9964	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011
.9965	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010
.9966	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009
.9967	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008
.9968	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007
.9969	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006
.9970	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005
.9971	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004
.9972	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003
.9973	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002
.9974	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001
.9975	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--
.9976	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--	
.9977	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--		
.9978	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--			
.9979	1.0020	1.0019	1.0018	1.0017	1.0017	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--				
.9980	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--					
.9981	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--						
.9982	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--							
.9983	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--								
.9984	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--									
.9985	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--										
.9986	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--											
.9987	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--												
.9988	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--													
.9989	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--														
.9990	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--															
.9991	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																
.9992	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																	
.9993	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																		
.9994	1.0005	1.0004	1.0003	1.0002	1.0001	--																			
.9995	1.0004	1.0003	1.0002	1.0001	--																				
.9996	1.0003	1.0002	1.0001	--																					
.9997	1.0002	1.0001	--																						
.9998	1.0001	--																							
.9999	--																								

	.9974	.9973	.9972	.9971	.9970	.9969	.9968	.9967	.9966	.9965	.9964	.9963	.9962	.9961	.9960	.9959	.9958	.9957	.9956	.9955	.9954	.9953	.9952	.9951	.9950
.9950	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--
.9951	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--	
.9952	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--		
.9953	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--			
.9954	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--				
.9955	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--					
.9956	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--						
.9957	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--							
.9958	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--								
.9959	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--									
.9960	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--										
.9961	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--											
.9962	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--												
.9963	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--													
.9964	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--														
.9965	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--															
.9966	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																
.9967	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																	
.9968	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																		
.9969	1.0005	1.0004	1.0003	1.0002	1.0001	--																			
.9970	1.0004	1.0003	1.0002	1.0001	--																				
.9971	1.0003	1.0002	1.0001	--																					
.9972	1.0002	1.0001	--																						
.9973	1.0001	--																							
.9974	--																								

	.9949	.9948	.9947	.9946	.9945	.9944	.9943	.9942	.9941	.9940	.9939	.9938	.9937	.9936	.9935	.9934	.9933	.9932	.9931	.9930	.9929	.9928	.9927	.9926	.9925
.9900	1.0050	1.0049	1.0048	1.0047	1.0046	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025
.9901	1.0049	1.0048	1.0047	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024
.9902	1.0048	1.0047	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023
.9903	1.0047	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022
.9904	1.0045	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021
.9905	1.0044	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020
.9906	1.0043	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019
.9907	1.0042	1.0041	1.0040	1.0039	1.0038	1.0037	1.0035	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018
.9908	1.0041	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017
.9909	1.0040	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016
.9910	1.0039	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015
.9911	1.0038	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014
.9912	1.0037	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013
.9913	1.0036	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012
.9914	1.0035	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011
.9915	1.0034	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010
.9916	1.0033	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009
.9917	1.0032	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008
.9918	1.0031	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007
.9919	1.0030	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006
.9920	1.0029	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005
.9921	1.0028	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004
.9922	1.0027	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003
.9923	1.0026	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002
.9924	1.0025	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001
.9925	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--
.9926	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--	
.9927	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--		
.9928	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--			
.9929	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--				
.9930	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--					
.9931	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--						
.9932	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--							
.9933	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--								
.9934	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--									
.9935	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--										
.9936	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--											
.9937	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--												
.9938	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--													
.9939	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--														
.9940	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--															
.9941	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																
.9942	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																	
.9943	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																		
.9944	1.0005	1.0004	1.0003	1.0002	1.0001	--																			
.9945	1.0004	1.0003	1.0002	1.0001	--																				
.9946	1.0003	1.0002	1.0001	--																					
.9947	1.0002	1.0001	--																						
.9948	1.0001	--																							
.9949	--																								

	.9924	.9923	.9922	.9921	.9920	.9919	.9918	.9917	.9916	.9915	.9914	.9913	.9912	.9911	.9910	.9909	.9908	.9907	.9906	.9905	.9904	.9903	.9902	.9901	.9900
.9930	1.0024	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--
.9931	1.0023	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--	
.9932	1.0022	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--		
.9933	1.0021	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--			
.9934	1.0020	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--				
.9935	1.0019	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--					
.9936	1.0018	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--						
.9937	1.0017	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--							
.9938	1.0016	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--								
.9939	1.0015	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--									
.9940	1.0014	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--										
.9941	1.0013	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--											
.9942	1.0012	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--												
.9943	1.0011	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--													
.9944	1.0010	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--														
.9945	1.0009	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--															
.9946	1.0008	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																
.9947	1.0007	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																	
.9948	1.0006	1.0005	1.0004	1.0003	1.0002	1.0001	--																		
.9949	1.0005	1.0004	1.0003	1.0002	1.0001	--																			
.9950	1.0004	1.0003	1.0002	1.0001	--																				
.9951	1.0003	1.0002	1.0001	--																					
.9952	1.0002	1.0001	--																						
.9953	1.0001	--																							
.9954	--																								

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1.0001	1.0002	1.0003	1.0004	1.0005	1.0006	1.0007	1.0008	1.0009	1.0010	1.0011	1.0012	1.0013	1.0014	1.0015	1.0016	1.0017	1.0018	1.0019	1.0020	1.0021	1.0022	1.0023	1.0024	1.0025
1.0002	1.0004	1.0006	1.0008	1.0010	1.0012	1.0014	1.0016	1.0018	1.0020	1.0022	1.0024	1.0026	1.0028	1.0030	1.0032	1.0034	1.0036	1.0038	1.0040	1.0042	1.0044	1.0046	1.0048	1.0050
1.0003	1.0006	1.0009	1.0012	1.0015	1.0018	1.0021	1.0024	1.0027	1.0030	1.0033	1.0036	1.0039	1.0042	1.0045	1.0048	1.0051	1.0054	1.0057	1.0060	1.0063	1.0066	1.0069	1.0072	1.0075
1.0004	1.0008	1.0012	1.0016	1.0020	1.0024	1.0028	1.0032	1.0036	1.0040	1.0044	1.0048	1.0052	1.0056	1.0060	1.0064	1.0068	1.0072	1.0076	1.0080	1.0084	1.0088	1.0092	1.0096	1.0100
1.0005	1.0010	1.0015	1.0020	1.0025	1.0030	1.0035	1.0040	1.0045	1.0050	1.0055	1.0060	1.0065	1.0070	1.0075	1.0080	1.0085	1.0090	1.0095	1.0100	1.0105	1.0110	1.0115	1.0120	1.0125
1.0006	1.0012	1.0018	1.0024	1.0030	1.0036	1.0042	1.0048	1.0054	1.0060	1.0066	1.0072	1.0078	1.0084	1.0090	1.0096	1.0102	1.0108	1.0114	1.0120	1.0126	1.0132	1.0138	1.0144	1.0150
1.0007	1.0014	1.0021	1.0028	1.0035	1.0042	1.0049	1.0056	1.0063	1.0070	1.0077	1.0084	1.0091	1.0098	1.0106	1.0113	1.0120	1.0127	1.0134	1.0141	1.0148	1.0155	1.0162	1.0169	1.0176
1.0008	1.0016	1.0024	1.0032	1.0040	1.0048	1.0056	1.0064	1.0072	1.0080	1.0088	1.0096	1.0104	1.0112	1.0121	1.0129	1.0137	1.0145	1.0153	1.0161	1.0169	1.0177	1.0185	1.0193	1.0202
1.0009	1.0018	1.0027	1.0036	1.0045	1.0054	.0063	1.0072	1.0081	1.0090	1.0099	1.0108	1.0118	1.0127	1.0136	1.0145	1.0154	1.0163	1.0172	1.0181	1.0190	1.0199	1.0208	1.0218	1.0227
1.0010	1.0020	1.0030	1.0040	1.0050	1.0060	1.0070	1.0080	1.0090	1.0100	1.0110	1.0121	1.0131	1.0141	1.0151	1.0161	1.0171	1.0181	1.0192	1.0202	1.0212	1.0222	1.0232	1.0242	1.0253
1.0011	1.0022	1.0033	1.0044	1.0055	1.0066	1.0077	1.0088	1.0099	1.0111	1.0122	1.0133	1.0144	1.0155	1.0166	1.0177	1.0188	1.0200	1.0211	1.0222	1.0233	1.0244	1.0256	1.0267	1.0278
1.0012	1.0024	1.0036	1.0048	1.0060	1.0072	1.0084	1.0096	1.0109	1.0121	1.0133	1.0145	1.0157	1.0169	1.0182	1.0194	1.0206	1.0218	1.0230	1.0243	1.0255	1.0267	1.0279	1.0292	1.0304
1.0013	1.0026	1.0039	1.0052	1.0065	1.0078	1.0091	1.0104	1.0118	1.0131	1.0144	1.0157	1.0170	1.0183	1.0197	1.0210	1.0223	1.0237	1.0250	1.0263	1.0277	1.0290	1.0304	1.0317	1.0330
1.0014	1.0028	1.0042	1.0056	1.0070	1.0084	1.0098	1.0113	1.0127	1.0141	1.0155	1.0169	1.0184	1.0198	1.0212	1.0226	1.0241	1.0255	1.0269	1.0284	1.0298	1.0313	1.0328	1.0342	1.0356
1.0015	1.0030	1.0045	1.0060	1.0075	1.0090	1.0105	1.0121	1.0136	1.0153	1.0166	1.0181	1.0197	1.0212	1.0227	1.0243	1.0258	1.0274	1.0289	1.0304	1.0320	1.0335	1.0351	1.0366	1.0382
1.0016	1.0032	1.0048	1.0064	1.0080	1.0096	1.0113	1.0129	1.0145	1.0161	1.0177	1.0194	1.0211	1.0227	1.0243	1.0259	1.0276	1.0292	1.0309	1.0325	1.0341	1.0358	1.0374	1.0391	1.0408
1.0017	1.0034	1.0051	1.0068	1.0085	1.0102	1.0120	1.0137	1.0154	1.0171	1.0188	1.0205	1.0223	1.0241	1.0259	1.0275	1.0293	1.0310	1.0328	1.0346	1.0363	1.0381	1.0398	1.0416	1.0434
1.0018	1.0036	1.0054	1.0072	1.0090	1.0108	1.0127	1.0145	1.0163	1.0181	1.0200	1.0218	1.0237	1.0255	1.0273	1.0292	1.0310	1.0329	1.0347	1.0366	1.0385	1.0404	1.0422	1.0441	1.0460
1.0019	1.0038	1.0057	1.0076	1.0095	1.0115	1.0134	1.0153	1.0172	1.0192	1.0211	1.0230	1.0250	1.0269	1.0289	1.0308	1.0328	1.0348	1.0367	1.0387	1.0407	1.0426	1.0446	1.0465	1.0486
1.0020	1.0040	1.0060	1.0080	1.0100	1.0121	1.0141	1.0161	1.0181	1.0202	1.0222	1.0243	1.0263	1.0283	1.0304	1.0325	1.0345	1.0366	1.0387	1.0408	1.0428	1.0449	1.0470	1.0491	1.0512
1.0021	1.0042	1.0063	1.0084	1.0105	1.0127	1.0148	1.0169	1.0191	1.0212	1.0233	1.0255	1.0276	1.0298	1.0319	1.0341	1.0363	1.0385	1.0407	1.0429	1.0451	1.0472	1.0494	1.0516	1.0538
1.0022	1.0044	1.0066	1.0088	1.0110	1.0133	1.0155	1.0177	1.0200	1.0222	1.0245	1.0267	1.0290	1.0312	1.0335	1.0358	1.0381	1.0404	1.0426	1.0449	1.0472	1.0495	1.0518	1.0542	1.0565
1.0023	1.0046	1.0069	1.0092	1.0115	1.0139	1.0162	1.0185	1.0209	1.0232	1.0256	1.0279	1.0303	1.0327	1.0351	1.0374	1.0398	1.0422	1.0446	1.0470	1.0494	1.0518	1.0542	1.0567	1.0592
1.0024	1.0048	1.0072	1.0096	1.0121	1.0145	1.0169	1.0194	1.0218	1.0243	1.0267	1.0292	1.0317	1.0341	1.0366	1.0391	1.0416	1.0441	1.0466	1.0491	1.0516	1.0541	1.0567	1.0592	1.0618
1.0025	1.0050	1.0075	1.0100	1.0126	1.0151	1.0176	1.0202	1.0227	1.0253	1.0278	1.0304	1.0330	1.0356	1.0382	1.0408	1.0434	1.0460	1.0486	1.0512	1.0538	1.0565	1.0591	1.0617	1.0644
1.0026	1.0052	1.0078	1.0104	1.0131	1.0157	1.0183	1.0210	1.0236	1.0263	1.0290	1.0317	1.0343	1.0370	1.0397	1.0424	1.0451	1.0478	1.0506	1.0533	1.0560	1.0588	1.0615	1.0643	1.0671
1.0027	1.0054	1.0081	1.0108	1.0136	1.0163	1.0191	1.0218	1.0246	1.0273	1.0301	1.0329	1.0357	1.0385	1.0413	1.0441	1.0469	1.0497	1.0525	1.0554	1.0583	1.0611	1.0640	1.0669	1.0697
1.0028	1.0056	1.0084	1.0112	1.0141	1.0169	1.0198	1.0226	1.0255	1.0284	1.0312	1.0341	1.0370	1.0399	1.0428	1.0458	1.0487	1.0516	1.0546	1.0575	1.0605	1.0634	1.0664	1.0694	1.0724
1.0029	1.0058	1.0087	1.0117	1.0146	1.0175	1.0205	1.0234	1.0264	1.0294	1.0324	1.0354	1.0384	1.0414	1.0444	1.0474	1.0505	1.0535	1.0566	1.0596	1.0627	1.0658	1.0689	1.0720	1.0751
1.0030	1.0060	1.0090	1.0120	1.0151	1.0181	1.0212	1.0242	1.0273	1.0304	1.0335	1.0366	1.0397	1.0428	1.0460	1.0491	1.0522	1.0554	1.0585	1.0617	1.0649	1.0681	1.0713	1.0745	1.0778
1.0031	1.0062	1.0093	1.0125	1.0156	1.0187	1.0219	1.0251	1.0283	1.0314	1.0346	1.0378	1.0410	1.0443	1.0475	1.0508	1.0540	1.0573	1.0606	1.0639	1.0672	1.0705	1.0738	1.0771	1.0805
1.0032	1.0064	1.0096	1.0129	1.0161	1.0193	1.0226	1.0259	1.0292	1.0325	1.0358	1.0391	1.0424	1.0457	1.0491	1.0525	1.0558	1.0592	1.0626	1.0660	1.0694	1.0728	1.0762	1.0797	1.0831
1.0033	1.0066	1.0099	1.0133	1.0166	1.0199	1.0233	1.0267	1.0301	1.0335	1.0369	1.0403	1.0438	1.0472	1.0507	1.0542	1.0576	1.0611	1.0646	1.0681	1.0716	1.0752	1.0787	1.0823	1.0859
1.0034	1.0068	1.0102	1.0137	1.0171	1.0206	1.0240	1.0275	1.0310	1.0345	1.0380	1.0416	1.0451	1.0487	1.0522	1.0558	1.0594	1.0630	1.0666	1.0702	1.0738	1.0775	1.0812	1.0849	1.0886
1.0035	1.0070	1.0105	1.0141	1.0176	1.0212	1.0248	1.0284	1.0320	1.0356	1.0392	1.0428	1.0465	1.0501	1.0538	1.0575	1.0612	1.0649	1.0686	1.0724	1.0761	1.0799	1.0837	1.0875	1.0913
1.0036	1.0072	1.0108	1.0145	1.0181	1.0218	1.0255	1.0292	1.0329	1.0366	1.0403	1.0441	1.0478	1.0516	1.0554	1.0592	1.0630	1.0668	1.0707	1.0745	1.0784	1.0823	1.0862	1.0901	1.0941
1.0037	1.0074	1.0111	1.0149	1.0186	1.0224	1.0262	1.0300	1.0338	1.0376	1.0415	1.0453	1.0492	1.0531	1.0570	1.0609	1.0648	1.0687	1.0727	1.0766	1.0806	1.0846	1.0887	1.0927	1.0968
1.0038	1.0076	1.0114	1.0153	1.0191	1.0230	1.0269	1.0308	1.0347	1.0387	1.0426	1.0466	1.0505	1.0545	1.0585	1.0626	1.0666	1.0707	1.0747	1.0788	1.0829	1.0870	1.0912	1.0953	1.0995
1.0039	1.0078	1.0117	1.0157	1.0197	1.0236	1.0276	1.0316	1.0356	1.0397	1.0437	1.0478	1.0518	1.0559	1.0601	1.0642	1.0684	1.0726	1.0768	1.0810	1.0852	1.0894	1.0937	1.0979	1.1022
1.0040	1.0080	1.0120	1.0161	1.0202	1.0242	1.0283	1.0324	1.0366	1.0407	1.0449	1.0491	1.0533	1.0575	1.0617	1.0659	1.0702	1.0745	1.0788	1.0831	1.0875	1.0918	1.0962	1.1006	1.1049
1.0041	1.0082	1.0124	1.0165	1.0207	1.0249	1.0291	1.0333	1.0375	1.0418	1.0460	1.0503	1.0546	1.0590	1.0633	1.0677	1.0720	1.0764	1.0808	1.0853	1.0897	1.0942	1.0987	1.1032	1.1077
1.0042	1.0084	1.0126	1.0169	1.0212	1.0255	1.0298	1.0341	1.0384	1.0428	1.0472	1.0516	1.0560	1.0604	1.0649	1.0694	1.0738	1.0784	1.0829	1.0874	1.0920	1.0966	1.1012	1.1058	1.1105
1.0043	1.0086	1.0130	1.0173	1.0217	1.0261	1.0305	1.0349	1.0394	1.0438	1.0483	1.0528	1.0574	1.0619	1.0665	1.0711	1.0757	1.0803	1.0849	1.0896	1.0943	1.0990	1.1037	1.1085	1.1133
1.0044	1.0088	1.0133	1.0177	1.0222	1.0267	1.0312	1.0357	1.0403	1.0449	1.0495	1.0541	1.0587	1.0634	1.0681	1.0728	1.0775	1.0822	1.0870	1.0918	1.0966	1.1014	1.1063	1.1111	1.1160
1.0045	1.0090	1.0135	1.0181	1.0227	1.0273	1.0319	1.0356	1.0412	1.0459	1.0506	1.0554	1.0602	1.0649	1.0697	1.0745	1.0793	1.0842	1.0891	1.0940	1.0989	1.1038	1.1088	1.1138	1.1188
1.0046	1.0092	1.0139	1.0185	1.0232	1.0279	1.0326	1.0374	1.0422	1.0470	1.0518	1.0566	1.0615	1.0664	1.0713	1.0762	1.0811	1.0861	1.0911	1.0961	1.1012	1.1062	1.1113	1.1165	1.1216
1.0047	1.0094	1.0142	1.0189	1.0237	1.0285	1.0334	1.0382	1.0431	1.0480	1.0529	1.0578	1.0629	1.0673	1.0729	1.0779	1.0830	1.0881	1.0932	1.0983	1.1035	1.1087	1.1139	1.1191	1.1244
1.0048	1.0096	1.0145	1.0193	1.0242	1.0291	1.0341	1.0391	1.0440	1.0490	1.0541	1.0591	1.0642	1.0693	1.0745	1.0796	1.0848	1.0900	1.0952	1.1005	1.1058	1.1111	1.1166	1.1218	1.1272
1.0049	1.0098	1.0148	1.0197	1.0247	1.0298	1.0348	1.0399	1.0450	1.0501	1.0552	1.0604	1.0656	1.0708	1.0761	1.0813	1.0866	1.0920	1.0973	1.1027	1.1081	1.1135	1.1190	1.1245	1.1300
1.0050	1.0100	1.0151	1.0202	1.0253	1.0304	1.0355	1.0407	1.0459	1.0511	1.0564	1.0617	1.0670	1.0723	1.0777	1.0831	1.0885	1.0939	1.0994	1.1049	1.1104	1.1160	1.1216	1.1273	1.1329

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1.0051	1.0102	1.0154	1.0206	1.0258	1.0310	1.0363	1.0415	1.0468	1.0522	1.0576	1.0629	1.0684	1.0738	1.0793	1.0848	1.0903	1.0959	1.1015	1.1071	1.1127	1.1184	1.1241	1.1298	1.1356
1.0052	1.0104	1.0157	1.0210	1.0263	1.0316	1.0370	1.0424	1.0478	1.0532	1.0587	1.0642	1.0698	1.0753	1.0809	1.0865	1.0922	1.0979	1.1036	1.1093	1.1151	1.1209	1.1267	1.1326	1.1384
1.0053	1.0106	1.0160	1.0214	1.0268	1.0322	1.0377	1.0432	1.0487	1.0543	1.0599	1.0655	1.0711	1.0768	1.0825	1.0883	1.0940	1.0998	1.1057	1.1115	1.1174	1.1233	1.1293	1.1353	1.1413
1.0054	1.0108	1.0163	1.0218	1.0273	1.0328	1.0384	1.0440	1.0497	1.0553	1.0610	1.0668	1.0725	1.0783	1.0841	1.0900	1.0959	1.1018	1.1077	1.1137	1.1197	1.1258	1.1319	1.1380	1.1441
1.0055	1.0110	1.0166	1.0222	1.0278	1.0335	1.0391	1.0449	1.0506	1.0564	1.0622	1.0680	1.0739	1.0798	1.0858	1.0917	1.0977	1.1037	1.1098	1.1159	1.1221	1.1283	1.1345	1.1407	1.1470
1.0056	1.0112	1.0169	1.0226	1.0283	1.0341	1.0399	1.0457	1.0516	1.0574	1.0634	1.0693	1.0753	1.0813	1.0874	1.0935	1.0996	1.1058	1.1120	1.1182	1.1244	1.1307	1.1371	1.1434	1.1498
1.0057	1.0114	1.0172	1.0230	1.0288	1.0347	1.0406	1.0465	1.0525	1.0585	1.0645	1.0706	1.0767	1.0828	1.0890	1.0952	1.1015	1.1077	1.1140	1.1204	1.1268	1.1332	1.1397	1.1462	1.1527
1.0058	1.0116	1.0175	1.0234	1.0293	1.0353	1.0413	1.0474	1.0534	1.0595	1.0657	1.0718	1.0781	1.0843	1.0906	1.0970	1.1033	1.1097	1.1161	1.1226	1.1291	1.1357	1.1423	1.1489	1.1556
1.0059	1.0118	1.0178	1.0238	1.0299	1.0359	1.0420	1.0482	1.0544	1.0606	1.0669	1.0731	1.0795	1.0858	1.0923	1.0987	1.1052	1.1117	1.1183	1.1249	1.1315	1.1382	1.1449	1.1516	1.1584
1.0060	1.0120	1.0181	1.0242	1.0304	1.0366	1.0428	1.0490	1.0553	1.0617	1.0680	1.0744	1.0809	1.0874	1.0939	1.1004	1.1071	1.1137	1.1204	1.1271	1.1339	1.1407	1.1475	1.1544	1.1613
1.0061	1.0122	1.0184	1.0246	1.0309	1.0372	1.0435	1.0498	1.0563	1.0627	1.0692	1.0757	1.0823	1.0889	1.0955	1.1022	1.1089	1.1157	1.1225	1.1293	1.1362	1.1431	1.1501	1.1571	1.1642
1.0062	1.0124	1.0187	1.0250	1.0314	1.0378	1.0442	1.0507	1.0572	1.0638	1.0704	1.0770	1.0837	1.0904	1.0972	1.1040	1.1108	1.1177	1.1246	1.1316	1.1386	1.1457	1.1528	1.1599	1.1671
1.0063	1.0126	1.0190	1.0254	1.0319	1.0384	1.0449	1.0515	1.0581	1.0648	1.0715	1.0783	1.0851	1.0919	1.0988	1.1057	1.1127	1.1197	1.1267	1.1338	1.1410	1.1482	1.1554	1.1627	1.1700
1.0064	1.0128	1.0193	1.0259	1.0324	1.0390	1.0457	1.0524	1.0591	1.0659	1.0727	1.0796	1.0865	1.0934	1.1004	1.1075	1.1146	1.1217	1.1289	1.1361	1.1434	1.1507	1.1580	1.1654	1.1729
1.0065	1.0130	1.0196	1.0263	1.0329	1.0396	1.0464	1.0532	1.0600	1.0669	1.0739	1.0809	1.0879	1.0950	1.1021	1.1092	1.1164	1.1237	1.1310	1.1384	1.1458	1.1532	1.1607	1.1682	1.1758
1.0066	1.0132	1.0199	1.0267	1.0334	1.0402	1.0471	1.0540	1.0610	1.0680	1.0750	1.0821	1.0893	1.0965	1.1037	1.1110	1.1183	1.1257	1.1331	1.1406	1.1482	1.1557	1.1634	1.1710	1.1788
1.0067	1.0134	1.0202	1.0271	1.0340	1.0409	1.0479	1.0549	1.0619	1.0691	1.0762	1.0834	1.0907	1.0980	1.1054	1.1128	1.1202	1.1277	1.1353	1.1429	1.1505	1.1583	1.1660	1.1738	1.1817
1.0068	1.0136	1.0205	1.0274	1.0344	1.0414	1.0484	1.0555	1.0627	1.0699	1.0772	1.0845	1.0918	1.0992	1.1067	1.1142	1.1217	1.1293	1.1370	1.1447	1.1524	1.1603	1.1681	1.1760	1.1840
1.0069	1.0139	1.0208	1.0278	1.0350	1.0421	1.0493	1.0565	1.0638	1.0712	1.0786	1.0860	1.0935	1.1010	1.1087	1.1163	1.1240	1.1318	1.1396	1.1474	1.1554	1.1633	1.1714	1.1794	1.1876
1.0070	1.0141	1.0212	1.0283	1.0355	1.0427	1.0500	1.0573	1.0648	1.0723	1.0798	1.0873	1.0949	1.1026	1.1103	1.1181	1.1259	1.1338	1.1417	1.1497	1.1578	1.1659	1.1740	1.1823	1.1905
1.0071	1.0143	1.0215	1.0287	1.0360	1.0434	1.0508	1.0582	1.0658	1.0733	1.0809	1.0886	1.0964	1.1041	1.1120	1.1199	1.1278	1.1358	1.1439	1.1520	1.1602	1.1684	1.1767	1.1851	1.1935
1.0072	1.0145	1.0218	1.0291	1.0365	1.0440	1.0515	1.0591	1.0667	1.0744	1.0821	1.0899	1.0978	1.1057	1.1136	1.1216	1.1297	1.1378	1.1460	1.1543	1.1625	1.1710	1.1794	1.1879	1.1965
1.0073	1.0147	1.0222	1.0295	1.0370	1.0446	1.0522	1.0599	1.0677	1.0756	1.0833	1.0912	1.0992	1.1072	1.1153	1.1234	1.1316	1.1399	1.1482	1.1566	1.1650	1.1735	1.1822	1.1907	1.1993
1.0074	1.0149	1.0224	1.0299	1.0376	1.0452	1.0530	1.0608	1.0686	1.0765	1.0845	1.0925	1.1006	1.1087	1.1169	1.1252	1.1335	1.1419	1.1504	1.1589	1.1675	1.1761	1.1848	1.1935	2.2024
1.0075	1.0151	1.0227	1.0303	1.0381	1.0459	1.0537	1.0616	1.0696	1.0776	1.0857	1.0938	1.1020	1.1103	1.1186	1.1270	1.1355	1.1440	1.1525	1.1612	1.1699	1.1787	1.1875	1.1964	2.2054
1.0076	1.0153	1.0230	1.0308	1.0386	1.0465	1.0545	1.0624	1.0705	1.0787	1.0868	1.0951	1.1034	1.1118	1.1203	1.1288	1.1374	1.1460	1.1547	1.1635	1.1723	1.1813	1.1902	1.1993	2.2084
1.0077	1.0155	1.0233	1.0312	1.0391	1.0471	1.0552	1.0633	1.0715	1.0797	1.0880	1.0964	1.1049	1.1134	1.1219	1.1306	1.1393	1.1481	1.1569	1.1658	1.1748	1.1838	1.1929	2.2021	2.2114
1.0078	1.0157	1.0236	1.0315	1.0396	1.0477	1.0559	1.0641	1.0724	1.0808	1.0892	1.0977	1.1063	1.1149	1.1236	1.1324	1.1412	1.1501	1.1591	1.1682	1.1772	1.1864	1.1957	2.2050	2.2144
1.0079	1.0159	1.0239	1.0320	1.0401	1.0483	1.0566	1.0650	1.0734	1.0819	1.0904	1.0990	1.1077	1.1165	1.1253	1.1342	1.1432	1.1522	1.1613	1.1704	1.1797	1.1890	1.1984	2.2079	2.2174
1.0080	1.0161	1.0242	1.0324	1.0406	1.0489	1.0574	1.0658	1.0744	1.0830	1.0916	1.1003	1.1091	1.1180	1.1270	1.1360	1.1451	1.1542	1.1634	1.1728	1.1821	1.1916	2.2011	2.2107	2.2204
1.0081	1.0163	1.0245	1.0328	1.0412	1.0496	1.0581	1.0667	1.0753	1.0840	1.0927	1.1017	1.1106	1.1196	1.1286	1.1378	1.1470	1.1563	1.1656	1.1751	1.1846	1.1942	2.2039	2.2136	2.2234
1.0082	1.0165	1.0248	1.0332	1.0417	1.0502	1.0588	1.0675	1.0763	1.0851	1.0940	1.1030	1.1120	1.1211	1.1303	1.1396	1.1489	1.1584	1.1679	1.1775	1.1871	1.1968	2.2066	2.2165	2.2265
1.0083	1.0167	1.0251	1.0336	1.0422	1.0508	1.0596	1.0684	1.0772	1.0862	1.0952	1.1043	1.1134	1.1227	1.1320	1.1414	1.1509	1.1604	1.1701	1.1798	1.1896	1.1994	2.2094	2.2195	2.2296
1.0084	1.0169	1.0254	1.0340	1.0427	1.0515	1.0603	1.0692	1.0781	1.0873	1.0964	1.1056	1.1149	1.1242	1.1337	1.1432	1.1528	1.1625	1.1723	1.1821	1.1920	2.2021	2.2121	2.2223	2.2326
1.0085	1.0171	1.0257	1.0344	1.0432	1.0521	1.0610	1.0701	1.0792	1.0883	1.0976	1.1069	1.1163	1.1258	1.1354	1.1450	1.1547	1.1645	1.1745	1.1845	1.1945	2.2047	2.2149	2.2252	2.2356
1.0086	1.0173	1.0260	1.0349	1.0438	1.0527	1.0618	1.0709	1.0801	1.0894	1.0988	1.1082	1.1177	1.1274	1.1371	1.1468	1.1567	1.1667	1.1767	1.1868	1.1970	2.2073	2.2177	2.2282	2.2387
1.0087	1.0175	1.0263	1.0353	1.0443	1.0534	1.0625	1.0718	1.0811	1.0905	1.1000	1.1095	1.1192	1.1289	1.1387	1.1486	1.1587	1.1687	1.1789	1.1892	1.1995	2.2099	2.2205	2.2311	2.2418
1.0088	1.0177	1.0266	1.0357	1.0448	1.0540	1.0633	1.0726	1.0821	1.0916	1.1012	1.1109	1.1206	1.1305	1.1405	1.1505	1.1606	1.1708	1.1812	1.1915	2.2020	2.2126	2.2232	2.2340	2.2448
1.0089	1.0179	1.0269	1.0361	1.0453	1.0546	1.0640	1.0735	1.0831	1.0927	1.1024	1.1122	1.1221	1.1321	1.1421	1.1523	1.1626	1.1729	1.1834	1.1939	2.2045	2.2152	2.2260	2.2370	2.2480
1.0090	1.0181	1.0272	1.0365	1.0458	1.0552	1.0647	1.0743	1.0840	1.0937	1.1036	1.1135	1.1235	1.1336	1.1438	1.1541	1.1645	1.1750	1.1856	1.1962	2.2070	2.2179	2.2288	2.2399	2.2511
1.0091	1.0183	1.0275	1.0369	1.0463	1.0559	1.0655	1.0752	1.0849	1.0948	1.1048	1.1149	1.1250	1.1352	1.1455	1.1560	1.1665	1.1771	1.1878	1.1986	2.2095	2.2205	2.2316	2.2429	2.2542
1.0092	1.0185	1.0279	1.0373	1.0469	1.0565	1.0662	1.0760	1.0859	1.0959	1.1060	1.1162	1.1265	1.1368	1.1472	1.1578	1.1685	1.1792	1.1901	2.2010	2.2121	2.2232	2.2345	2.2459	2.2573
1.0093	1.0187	1.0282	1.0377	1.0474	1.0571	1.0669	1.0769	1.0869	1.0970	1.1072	1.1175	1.1279	1.1385	1.1489	1.1596	1.1704	1.1813	1.1923	2.2034	2.2146	2.2259	2.2373	2.2488	2.2604
1.0094	1.0189	1.0285	1.0381	1.0479	1.0577	1.0677	1.0777	1.0879	1.0981	1.1084	1.1188	1.1293	1.1400	1.1507	1.1615	1.1724	1.1834	1.1945	2.2058	2.2171	2.2286	2.2401	2.2518	2.2635
1.0095	1.0191	1.0288	1.0385	1.0484	1.0583	1.0684	1.0786	1.0888	1.0992	1.1096	1.1201	1.1308	1.1415	1.1524	1.1633	1.1744	1.1855	1.1968	2.2082	2.2196	2.2312	2.2429	2.2547	2.2667
1.0096	1.0193	1.0291	1.0390	1.0489	1.0589	1.0692	1.0794	1.0898	1.1003	1.1108	1.1215	1.1322	1.1431	1.1541	1.1652	1.1764	1.1877	1.1992	2.2106	2.2222	2.2339	2.2457	2.2577	2.2698
1.0097	1.0195	1.0294	1.0394	1.0494	1.0596	1.0699	1.0803	1.0908	1.1013	1.1120	1.1228	1.1337	1.1447	1.1559	1.1670	1.1783	1.1898	2.2013	2.2130	2.2247	2.2366	2.2486	2.2607	2.2730
1.0098	1.0197	1.0297	1.0398	1.0500	1.0603	1.0707	1.0811	1.0918	1.1024	1.1132	1.1241	1.1352	1.1463	1.1576	1.1689	1.1803	1.1919	2.2036	2.2154	2.2273	2.2393	2.2514	2.2637	2.2761
1.0099	1.0199	1.0300	1.0402	1.0505	1.0609	1.0714	1.0820	1.0927	1.1035	1.1145	1.1255	1.1366	1.1479	1.1593	1.1707	1.1823	1.1940	2.2058	2.2178	2.2298	2.2420	2.2543	2.2667	2.2793
1.0100	1.0201	1.0303	1.0406	1.0510	1.0615	1.0721	1.0829	1.0937	1.1046	1.1157	1.1268	1.1381	1.1495	1.1610	1.1726	1.1843	1.1961	2.2081	2.2202	2.2324	2.2447	2.2572	2.2697	2.2824

APPENDIX

EVALUATION SHEET

Step No. _____

Input

Display Ident. _____
Component _____
Base Time _____

Par	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Mediating Process

Component _____
Base Time _____

Par	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
Total			

Output

Control Ident. _____
Component _____
Base Time _____

Par	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
Total			

Step Totals		

Between Step Time

Percept.	Location	Equip. Delay

Step No. _____

Input

Display Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Mediating Process

Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
Total			

Output

Control Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
Total			

Step Totals		

Between Step Time

Percept.	Location	Equip. Delay

Step No. _____

Input

Display Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Mediating Process

Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
Total			

Output

Control Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
Total			

Step Totals		

Between Step Time

Percept.	Location	Equip. Delay

EVALUATION SHEET

Step No. _____

Input

Display Ident. _____
Component _____
Base Time _____

Par	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Mediating Process

Component _____
Base Time _____

Par	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
Total			

Output

Control Ident. _____
Component _____
Base Time _____

Par	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
Total			

Step Totals

Between Step Time

Percept.	Location	Equip. Delay

Step No. _____

Input

Display Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Mediating Process

Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
Total			

Output

Control Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel.
1			
2			
3			
4			
5			
6			
7			
8			
Total			

Step Totals

Between Step Time

Percept	Location	Equip. Delay

Step No. _____

Input

Display Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Re
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
Total			

Mediating Process

Component _____
Base Time _____

Par.	Dim. Ind.	Time	Re
1			
2			
3			
4			
5			
Total			

Output

Control Ident. _____
Component _____
Base Time _____

Par.	Dim. Ind.	Time	Rel
1			
2			
3			
4			
5			
6			
7			
8			
Total			

Step Totals

Between Step Time

Percept.	Location	Equ Del

MISSION AND PHASE SUMMARY FORM

Phase Scores	INPUTS		MED. PROS.		OUTPUTS		Percept. and Loc.	TOTAL PHASE SCORES		Equipment
	Time	Reli.	Time	Reli.	Time	Reli.	Time	Time	Reli.	Delay Time
1.										
2.										
3.										
4.										
5.										
6.										
TOTAL ASPECT SCORES								TOTAL MISSION Time	TOTAL MISSION Reli.	

Equipment _____

Mission _____

Evaluator _____

FRAMES

	INPUTS									MEDIATING
	Circular Scales	Counters	Labeling	Lights	Linear Scales	Non-Speech	Scopes	Semi-Circular Scalos	Speech	Identification/Recognition
Base Time	.50	[illegible]	20	.25	1.00	.23	3.80	.50	2.02	.25
Optimum Reli.	.9971	9978	9995	.9994	.9979	.9996	.9996	.9920	.9989	.9998
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
Step No.										
Time										
Reliability										
TOTAL TIME										
TOTAL RELIABILITY										

Phase _____

OUTPUTS											
Cable Connections	Cranks	Disconnecting Cables	Joystick	Knobs	Lever	Object Positioning	Pushbuttons	Rotary Selector	Speaking	Toggle Switch	w.t
.80	4.31	.50	1.93	1.49	1.15	1.10	.57	1.00	.10	.47	1
.9994	.9945	.9998	.9858	.9990	.9931	.9995	.9992	9988	.9997	.9993	

Component	Steps	[illegible]	Original	Revised	Original	Revised

Note: Training and selection recommendations cannot be quantitatively justified.

Phase Totals

Phase	Time		Reliability		Phase	Time		Reliability	
	Original	Revised	Original	Revised		Original	Revised	Original	Revised
1.					4.				
2.					5.				
3.					6.				

Mission Totals

Time		Reliability	
Original	Revised	Original	Revised